



# UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,435	06/30/2001	A. Francis Stewart	9882-012	8975

7590 09/22/2004

Craig J. Arnold, Esq.  
AMSTER, ROTHSTEIN & EBENSTEIN LLP  
90 Park Avenue  
New York, NY 10016

EXAMINER

MCGARRY, SEAN

ART UNIT	PAPER NUMBER
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1635

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/895,435

**Applicant(s)**

STEWART ET AL.

**Examiner**

Sean R McGarry

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5, 11-20 and 53-74 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-20, 53-55, 57-60, 62-65 and 67-74 is/are rejected.
- 7) ☒ Claim(s) 56, 61 and 66 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>sequence alignment</u> .               |

### **DETAILED ACTION**

Claims 1-5, 11-20, 53-55, 57-60, 62-65, and 67-74 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment filed 6/8/04 introduces new matter into the disclosure. The added material which is not supported by the original disclosure is as follows: The language introduced into the claims refers to functional variants that alter SEQ ID NO: 3 only in the central crossover region and also refers to inverted repeat alterations at this location. Applicant has pointed to page 5 of the specification. It is noted that nowhere on page 5 is there a reference to crossover region modifications or inverse repeat modifications in the context of the claimed invention.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claims 1-5, 11-13, 15-20, 54, 55, 57, 59, 60, 64, 65, and 67 remain and new claims 68-74 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

The specification discloses SEQ ID NO:3 which corresponds to the cDNA/genomic DNA encoding the human/rat/mouse species of TRT promoter and SEQ ID NO: 2 which corresponds to TRT'. SEQ ID NO: 3 and SEQ ID NO: 2 meet the written description provisions of 35 USC 112, first paragraph. However, the claims are directed to encompass "functional variants thereof" which may correspond to sequences from other species, mutated sequences, allelic variants, splice variants, sequences that have a recited degree of identity (similarity, homology), functional variants that are altered from SEQ ID NO: 3 only in the crossover region including, but not limited to inverted repeat, and so forth. None of these sequences meet the written description provision of 35 USC 112, first paragraph. The specification provides insufficient written description to support the genus encompassed by the claim. It is noted that applicant's specification provides a description of what might be a "functional variant" at pages 6 and 11, for example. Applicant description/definition requires only that at least some change in sequence is made. There is no upper limit to the changes and the functional variants read on species with no apparent structural similarity as SEQ ID NO: 2 or 3 but which would have the same function. It is noted that the specification provides a few examples, but only examples where the structure is quite similar to that of SEQ ID NO:2 or 3 for example. The specification provides a method to screen for

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functional variants. The specification provides potential methods for finding species of the claimed invention , but fails to provide the structure of these species.

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed*." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.)

With the exception of SEQ ID NO: 3 or 2, the skilled artisan cannot envision the detailed chemical structure of the encompassed polynucleotides, **regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. The nucleic acid itself is required.** See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993) and Amgen Inc. V. Chugai Pharmaceutical Co. Ltd., 18 USPQ2d 1016. In Fiddes v. Baird, 30 USPQ2d 1481, 1483, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class. The specification provided only the bovine sequence.

Finally, University of California v. Eli Lilly and Co., 43 USPQ2d 1398, 1404, 1405 held that:

...To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can

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clearly conclude that "the inventor invented the claimed invention." *Lockwood v. American Airlines, Inc.* , 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (1997); *In re Gosteli* , 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) ("[T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." *Lockwood*, 107 F.3d at 1572, 41 USPQ2d at 1966.

An adequate written description of a DNA, such as the cDNA of the recombinant plasmids and microorganisms of the '525 patent, "requires a precise definition, such as by structure, formula, chemical name, or physical properties," not a mere wish or plan for obtaining the claimed chemical invention. *Fiers v. Revel* , 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Accordingly, "an adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it; what is required is a description of the DNA itself." *Id.* at 1170, 25 USPQ2d at 1606.

The name cDNA is not itself a written description of that DNA; it conveys no distinguishing information concerning its identity. While the example provides a

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process for obtaining human insulin-encoding cDNA, there is no further information in the patent pertaining to that cDNA's relevant structural or physical characteristics; in other words, it thus does not describe human insulin cDNA. Describing a method of preparing a cDNA or even describing the protein that the cDNA encodes, as the example does, does not necessarily describe the cDNA itself. No sequence information indicating which nucleotides constitute human cDNA appears in the patent, as appears for rat cDNA in Example 5 of the patent. Accordingly, the specification does not provide a written description of the invention of claim 5.

Therefore, only SEQ ID NO: 3 or 2 but not the full breadth of the claim (or none of the sequences encompassed by the claim) meets the written description provision of 35 USC 112, first paragraph. The species specifically disclosed are not representative of the genus because the genus is highly variant. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. (See page 1115.)

Applicants arguments filed 6/08/04 have been considered but are not persuasive.

Applicant argues that the invention is now limited to functional variants where the variants differ from SEQ ID NO: 3 only in the crossover region. Applicant asserts that such functional variants are within the scope of the invention and that such variants are sufficiently described at page 5 of the specification. It is noted that there is no disclosure of a central crossover region in the context of the claimed invention on page 5. There

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are no functional variants disclosed that possess the requisite function of the exemplified nucleic acids. The declaration of Bernard Hallet does not take the place of an adequate description of the invention in the specification. It is again noted that **regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for isolating it. The nucleic acid itself is required.** See Fiers v. Revel, 25 USPQ2d 1601, 1606 (CAFC 1993). Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 USC 112 is severable from its enablement provision. (See page 1115.) So, although the declaration might provide evidence of enablement for a particular embodiment, it does not remedy the lack of an adequate written description of the invention.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 11-13, 53, 55, 58, 60 remain rejected under 35 U.S.C. 102(b) as being anticipated by Mahillon et al [NAR Vol. 16(24):1988].

Mahillon et al disclose a pGI2 plasmid sequence (a vector with sequences other than Tn4430 (ie “heterologous” as defined in the instant specification at page 6, for example)). The sequence includes SEQ ID NO:3 and SEQ ID NO:2 and does not



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contain more than 200 contiguous nucleotides of SEQ ID NO: 4. The pGI2 plasmid was cloned and characterized in E.coli cells.

Claims 1-3, 11-13, 53, 55, 58, and 60 remain under 35 U.S.C. 102(b) as being anticipated by Mahillon et al [The EMBO Journal Vol. 7(5):1515-1526, 1988].

Mahillon et al have disclosed several plasmid vectors that comprises SEQ ID NO: 3 and SEQ ID NO: 2 while not comprising more 100 contiguous nucleotides of SEQ ID NO: 4. Mahillon et al have disclosed that the plasmid vectors have various selectable markers which of themselves would be "heterologous" nucleic acid sequences as defined in the instant specification (see page 6, for example).

Claims 20, 63, and 65 remain rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mahillon et al [The EMBO Journal Vol. 7(5):1515-1526, 1988].

Mahillon et al is relied upon as above. Additionally Mahillon et al disclose that the vectors described encode Tnpl and further the plasmids are in E. coli cells which are capable of expressing such heterologous proteins from vectors. Although not specifically disclosed in the reference it would appear inherent in the reference that the disclosed compositions/compounds in [a] container/s since one would keep such compositions in a container to keep the experimental compounds free from contamination, to minimize loss due to evaporation, or to keep them [the experimental

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compounds] from covering a work area, for example. If the compositions/compounds disclosed in the reference were not in containers it would have been obvious to do so for the same reasons above where inherency has been presumed.

Applicants arguments filed 6/08/04 have been considered but are not persuasive.

Applicant argues that the prior art contains all 249 nucleotides of SEQ ID NO: 4 and provides sequences as evidence. These sequences are not convincing since these sequences are not those sequences of the prior art applicant is provided as an attachment to this Official Action an alignment of the prior art reference and SEQ ID NO: 4 of the instant application. It is clear that neither sequence contains more than 200 contiguous nucleates of SEQ ID NO: 4. Applicant argues that one would not provide the possible constituents of the claimed kits in separate containers. It is noted that the rejection of record clearly set forth the reasons for storage in a container or containers. Applicant argues as if the only other possible constituent is a Tnpl protein. This is not the case since the invention also considers a cell capable of expressing a Tnpl protein, for example.

Claims 56, 61, and 66 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean R McGarry whose telephone number is (571) 272-0761. The examiner can normally be reached on M-Th (6:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John LeGuyader can be reached on (571) 272-0760. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sean R McGarry  
Primary Examiner  
Art Unit 1635

1635

SRM

GenCore version 5.1.6  
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OM nucleic - nucleic search, using sw model

Run on: February 28, 2004, 05:52:06 ; Search time 1253.82 Seconds  
(without alignments)  
8607.626 Million cell updates/sec

Title: US-09-895-435A-4  
Perfect score: 249  
Sequence: 1 ggggtaccgcagcatttcg.....gacggggggaatacatg 249

Scoring table: IDENTITY\_NUC  
Gapex 10.0 , Gapext 1.0

Searched: 3470272 seqs, 21671516995 residues  
Total number of hits satisfying chosen parameters: 6940544

Minimum DB seq length: 0  
Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%  
Maximum Match 100%  
Listing first 45 summaries

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3: gb\_in.\*  
4: gb\_om.\*  
5: gb\_ov.\*  
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8: gb\_pl.\*  
9: gb\_pr.\*  
10: gb\_ro.\*  
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35: em\_hgt\_rtd.\*  
36: em\_hgt\_mam.\*  
37: em\_hgt\_vrt.\*  
38: em\_sy.\*  
39: em\_hgt\_hum.\*  
40: em\_hgt\_mus.\*  
41: em\_hgt\_other.\*

Pred. No. is the number of results predicted by chance to have a

score greater than or equal to the score of the result being printed,  
and is derived by analysis of the total score distribution.

SUMMARIES

Result No.	Score	Match	Length	DB	ID	Description
1	249	100.0	249	6	AX671525	AX671525 Sequence
2	244	98.0	244	6	AX671522	AX671522 Sequence
3	241	96.8	241	1	BTM4430	X07651 Bacillus th
4	241	96.8	9672	1	BTM4430	X13481 Bacillus th
5	118	47.4	118	6	AX671523	AX671523 Sequence
6	114.4	45.9	116	6	AX671528	AX671528 Sequence
7	114.4	45.9	116	6	AX671529	AX671529 Sequence
8	64	25.7	116	6	AX671530	AX671530 Sequence
9	53	21.3	2015	3	AB064263	AB064263 Plasmodu
10	53	21.3	158548	3	PFMA13P2	AC034558 Plasmodu
11	53	21.3	205429	2	AC005506	AC005506 Plasmodu
12	53	21.3	253132	3	AE014846	AE014846 Plasmodu
13	52.8	21.2	609	8	PRU251061	AF251061 Plagiocla
14	52	20.9	1018	8	AF402569	AF402569 Clavijsa
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16	51.8	20.8	83332	9	AC095051	AC095051 Homo sapi
17	51.8	20.8	343050	3	PF929353	AL929353 Plasmodu
18	51.4	20.6	271546	3	AE014843	AE014843 Plasmodu
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20	51	20.5	124	6	AX671531	AX671531 Sequence
21	51	20.5	60529	2	AC144825	AC144825 Danio rer
22	51	20.5	90859	8	AC005561	AC005561 Arabidops
23	51	20.5	252632	3	AE014818	AE014818 Plasmodu
24	50.8	20.4	203958	5	AL954339	AL954339 Zebrafish
25	50.4	20.2	110000	2	PFMA113_22	Continuation (23 o
26	50.2	20.2	6550	6	AX344862	AX344862 Sequence
27	50.2	20.2	99858	9	HSJ1059A9	AL118524 Human DNA
28	50.2	20.2	103942	2	AC091859	AC091859 Homo sapi
29	50.2	20.2	110000	2	AC117408_1	Continuation (2 of
30	50.2	20.2	113172	9	AL161613	AL161613 Human DNA
31	50.2	20.2	148263	9	AC091988	AC091988 Homo sapi
32	50.2	20.2	172043	9	AC028797	AC028797 Homo sapi
33	50.2	20.2	173181	9	EX005037	EX005037 Human DNA
34	50.2	20.2	182366	9	AL591926	AL591926 Human DNA
35	50.2	20.2	188062	9	AL162731	AL162731 Human DNA
36	50.2	20.2	250029	3	AE014820	AE014820 Plasmodu
37	50.2	20.2	250707	3	AE014848	AE014848 Plasmodu
38	50.2	20.2	340552	3	PF929354	AL929354 Plasmodu
39	50	20.1	11308	1	AE007654	AE007654 Clostridi
40	50	20.1	163116	9	AL161420	AL161420 Human DNA
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ALIGNMENTS

RESULT 1  
LOCUS AX671525  
DEFINITION Sequence 4 from Patent WO03004652  
ACCESSION AX671525  
VERSION AX671525.1 GI:29329875  
KEYWORDS  
SOURCE  
ORGANISM  
REFERENCE  
AUTHORS  
TITLE  
ABSTRACT  
JOURNAL

249 bp DNA linear PAT 27-MAR-2003

Bacillus thuringiensis  
Bacillus thuringiensis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

Stewart, P.A., Zhang, Y. and Hallet, B.  
Use of a tyrosine recombinase for genetic engineering  
Patent: WO 03004652-A 4 16-JAN-2003;

The European Molecular Biology Laboratory (DE) ; L'Universite  
Catholique de Louvain (BE)

## FEATURES

Source  
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## ORIGIN

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DB 181 AACACAAATTCATATATATATCTTTTACGCAACACAAATTTATAGACCGGAGGA 240  
QY 241 AATCATG 249  
DB 241 AATCATG 249

## RESULT 2

AX671522 244 bp DNA linear PAT 27-MAR-2003  
LOCUS  
DEFINITION  
Sequence 1 from Patent WO03004652.  
ACCESSION  
AX671522  
VERSION  
AX671522.1 GI:29329872

KEYWORDS  
Bacillus thuringiensis  
Bacillus thuringiensis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus group.

## ORGANISM

REFERENCE  
1  
Stewart P.A., Zhang Y. and Hallet B.  
Use of a tyrosine recombinase for genetic engineering  
Patent: WO 03004652-A 1 15-JAN-2003.  
JOURNAL  
The European Molecular Biology Laboratory (DE) ; L'Universite  
Catholique de Louvain (BE)

## FEATURES

Source  
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/mol\_type="unassigned DNA"  
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## ORIGIN

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Best Local Similarity 100.0%; Pred. No. 8.3e-32;  
Matches 244; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 3 GGTACCGCCAGATTTCGAAAAAACCAGCTAAGAAATCAGAGTTAAAAAATCAG 62  
DB 1 GGTACCGCCAGATTTCGAAAAAACCAGCTAAGAAATCAGAGTTAAAAAATCAG 60  
QY 63 AAAATATATATATCTTCTTGACATACATCTCTTTTATACAAAAAATACAA 122  
DB 61 AAAATATATATATCTTCTTGACATACATCTCTTTTATACAAAAAATACAA 120  
QY 123 CAATATATATCTTCTTGACATACATCTCTTTTATACAAAAAATACAA 182  
DB 121 CAATATATATCTTCTTGACATACATCTCTTTTATACAAAAAATACAA 180

QY 183 CACATATATATATCTTCTTGACATACATCTCTTTTATACAAAAAATACAA 242  
DB 181 CACATATATATATCTTCTTGACATACATCTCTTTTATACAAAAAATACAA 240  
QY 243 TCAC 246  
DB 241 TCAC 244

RESULT 3  
BTN4430  
LOCUS  
DEFINITION  
Bacillus thuringiensis transposon Tn4430.  
ACCESSION  
X07651  
VERSION  
X07651.1 GI:40347

KEYWORDS  
Plasmid; resolvase; tnpA gene; tnpI gene; transposase; transposon.  
SOURCE  
Bacillus thuringiensis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus group.

REFERENCE  
1  
Mahillon, J. and Lereclus, D.  
STRUCTURAL AND FUNCTIONAL ANALYSIS OF Tn4430: IDENTIFICATION OF AN  
INTEGRASE-LIKE PROTEIN INVOLVED IN THE CO-INTEGRATE-RESOLUTION  
PROCESS  
EMBO J. 7 (5), 1515-1526 (1988)

JOURNAL  
MEDLINE  
FBI  
COMMENT  
Data kindly reviewed (03-APR-1989) by Lereclus D.  
LOCATION/QUALIFIERS  
1..4149

ORGANISM  
Bacillus thuringiensis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus group.

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RESULT 4  
BTPG12XX  
LOCUS  
DEFINITION  
ACCESSION  
VERSION  
KEYWORDS  
SOURCE  
ORGANISM

BTPG12XX  
Bacillus thuringiensis plasmid pG12 with transposon Tn4430.  
X13481  
GI:3171732  
plasmid; pG12; recombinase; resolvase; transposase;  
transposon; unidentified reading frame.  
Bacillus thuringiensis  
Bacillus thuringiensis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus Group.

REFERENCE

AUTHORS

TITLE

JOURNAL

MEDLINE

PUBMED

REFERENCE

AUTHORS

TITLE

JOURNAL

REMARK

AUTHORS

TITLE

JOURNAL

COMMENT

FEATURES

source

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## ORIGIN

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Best Local Similarity 98.0%; Pred. No. 1.28-31;
Matches 244; Conservative 0; Mismatches 5; Indels 0; Gaps 0;

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AX671523 VERSION
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KEYWORDS
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ORGANISM
Bacillus thuringiensis
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus
cereus group.
REFERENCE
1 Stewart, F.A., Zhang, Y. and Hallet, B.
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TITLE
JOURNAL
Use of a tyrosine recombinase for genetic engineering
Patent: WO 03004652-A 2 16-JAN-2003;
The European Molecular Biology Laboratory (DE); L'Universite
Catholique De Louvain (BE)
FEATURES
Source
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Qy 173 TTTTACCGCACACATTTATCGTAAATAATAATCTTTTAGCGCAACAATTTATAG 230
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KEYWORDS
SOURCE
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Bacillus thuringiensis
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus
cereus group.
REFERENCE
1 Stewart, F.A., Zhang, Y. and Hallet, B.
AUTHORS
TITLE
JOURNAL
Use of a tyrosine recombinase for genetic engineering
Patent: WO 03004652-A 7 16-JAN-2003;
The European Molecular Biology Laboratory (DE); L'Universite
Catholique De Louvain (BE)
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AX671529.1 GI:29329879
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Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus
cereus group.
REFERENCE
1 Stewart, F.A., Zhang, Y. and Hallet, B.
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